

PARSONS TECHNICAL MEMORANDUM

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DATE: August 2011

TO: File

FROM:

SUBJECT: Water Resources assessment for Pyramid/McCarran EIS

This section describes the regulatory setting associated with storm water; the affected environment; the potential environmental consequences of the Pyramid Way and McCarran Boulevard Intersection Improvement Project (Project) on water quality that would result from the Project; and the water quality control measures that would minimize potential impacts. This section includes a range of topics related to water resources, including the regulatory setting, receiving water bodies and water quality. Surface water resources are important for fish and wildlife habitat, urban and agricultural water supply and conveying floodwaters. Additional information related to hydrology and floodplains, such as stream crossings, onsite and offsite drainage and storm water systems is included in the Floodplain resource section of the EIS.

3.1 Regulatory Setting

3.1.1 Federal

3.1.1.1 NATIONAL ENVIRONMENTAL POLICY ACT (42 U.S.C. 4321 ET SEQ.)

The National Environmental Policy Act (NEPA) requires the consideration of potential environmental effects, including potential effects on hydrology and water resources, in the evaluation of any proposed federal action. NEPA also obligates federal agencies to consider the environmental consequences and costs in their projects and programs as part of the planning process. General NEPA procedures are set forth in the Council on Environmental Quality (CEQ) regulations, 23 CFR 771.

3.1.1.2 **Clean Water Act (33 U.S.C. 1251 et seq.)**

The Clean Water Act (CWA) is the primary federal law protecting water quality of the nation's surface waters, including lakes, rivers and coastal wetlands. The primary principle is that any pollutant discharge into the nation's waters is prohibited unless specifically authorized by a permit; permit review is the CWA's primary regulatory tool. The applicable sections of the CWA are discussed further below.

- *Water Quality Impairments (Section 303 (d))*

Section 303(d) requires each state to provide a list of impaired waters that do not meet or are expected not to meet state water quality standards as defined by that section. It also requires the state to develop total maximum daily loads (TMDLs) from the pollution sources for such impaired water bodies.

- *Technology Based Standards Program (Section 304)*

Provides for individual control strategies for toxic pollutants.

- *Clean Water Quality Certification (Section 401)*

Section 401 regulates impacts of all discharges of pollutants including the placement of dredged or fill material on water quality. All federal permits for work in marine waters, rivers, streams and wetlands require Section 401 water quality certification. The Nevada Division of Environmental Protection (NDEP) administers the certification program in Nevada.

- *National Pollutant Discharge Elimination System (NPDES) (Section 402)*

Section 402 establishes a permitting system for the discharge of any pollutant (except dredge or fill material) into waters of the United States. It requires a NPDES permit for discharges.

- *Permit for Fill Material in Waters and Wetlands (Section 404)*

Section 404 establishes a permit program administered by the United States Army Corps of Engineers (USACE). Section 404 regulates the discharge of dredged or fill material into waters of the United States (including wetlands).

3.1.2 Nevada Regulations

3.1.2.1 GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY

Under General Permit No. NVR 100000, all Nevada Department of Transportation (NDOT) projects disturbing one acre or more are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activity by submitting a Notice of Intent (NOI) and the filing fee with the NDEP within two (2) days prior to the start of construction (Nevada DOT 2006). Prior to filing a NOI, the Storm Water Pollution Prevention Plan (SWPPP) must also be completed by the contractor and made available at the project site for review.

The SWPPP has five (5) main objectives:

1. All pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled;
2. All non-stormwater discharges are identified and either eliminated, controlled, or treated;
3. Site Best Management Practices (BMPs) are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non- stormwater discharges from the construction activity;
4. Calculations and design details as well as BMP controls for site run-on are complete and correct, and
5. Stabilization BMPs designed to eliminate or reduce pollutants after construction is

complete have been installed.

The SWPPP is designed to be a useful document for those who must implement the SWPPP on a daily basis in the field.

3.1.2.2 NPDES PERMIT FOR DISCHARGES FROM NEVADA DEPARTMENT OF TRANSPORTATION MUNICIPAL SEPARATE STORM SEWER SYSTEMS (NV0023329)

NDOT's Statewide Municipal Separate Storm Sewer System (MS4) permit authorizes NDOT to discharge storm water and certain non-storm water runoff to waters of the United States. This permit includes conditions that are intended to protect the quality of receiving waters (Nevada DOT 2006).

3.1.2.3 TEMPORARY WORK IN WATERWAYS/DISCHARGE PERMIT

NDEP requires a Temporary Working in Waterways/Discharge Permit for work within or immediately adjacent to live streams or water bodies. Permits are issued for both routine maintenance and for short-term construction projects. For NDOT projects, the contractor is responsible for obtaining this permit and the NDOT Water Quality Specialist provides oversight of the process, as needed (Nevada DOT 2006).

3.2 Affected Environment

The Pyramid Way and McCarran Boulevard Intersection Improvement Project limits extend along McCarran Boulevard from Rock Boulevard to 4th Street, and along Pyramid Way from Tyler Way to approximately eight hundred feet (800') north of the existing Queen Way intersection (Parsons 2011). The general project limits are depicted in Figure 3.1 - Project Limits.

The Project is within the Northwest Truckee Meadows Planning Area. The project corridor is located within a fully built environment with an area predominated by impervious surface. The corridor runs through an area characterized by single-family residences in the northwest, northeast, and southeast quadrants along with commercial use facilities in the southwest quadrant. The proposed Project lies within the Truckee River Basin and the Truckee Meadows hydrographic area (Division of Water Resources, State of Nevada 2011). Truckee Meadows is a bowl-shaped valley, approximately 10 miles wide and 16 miles long, containing the cities of Reno and Sparks.

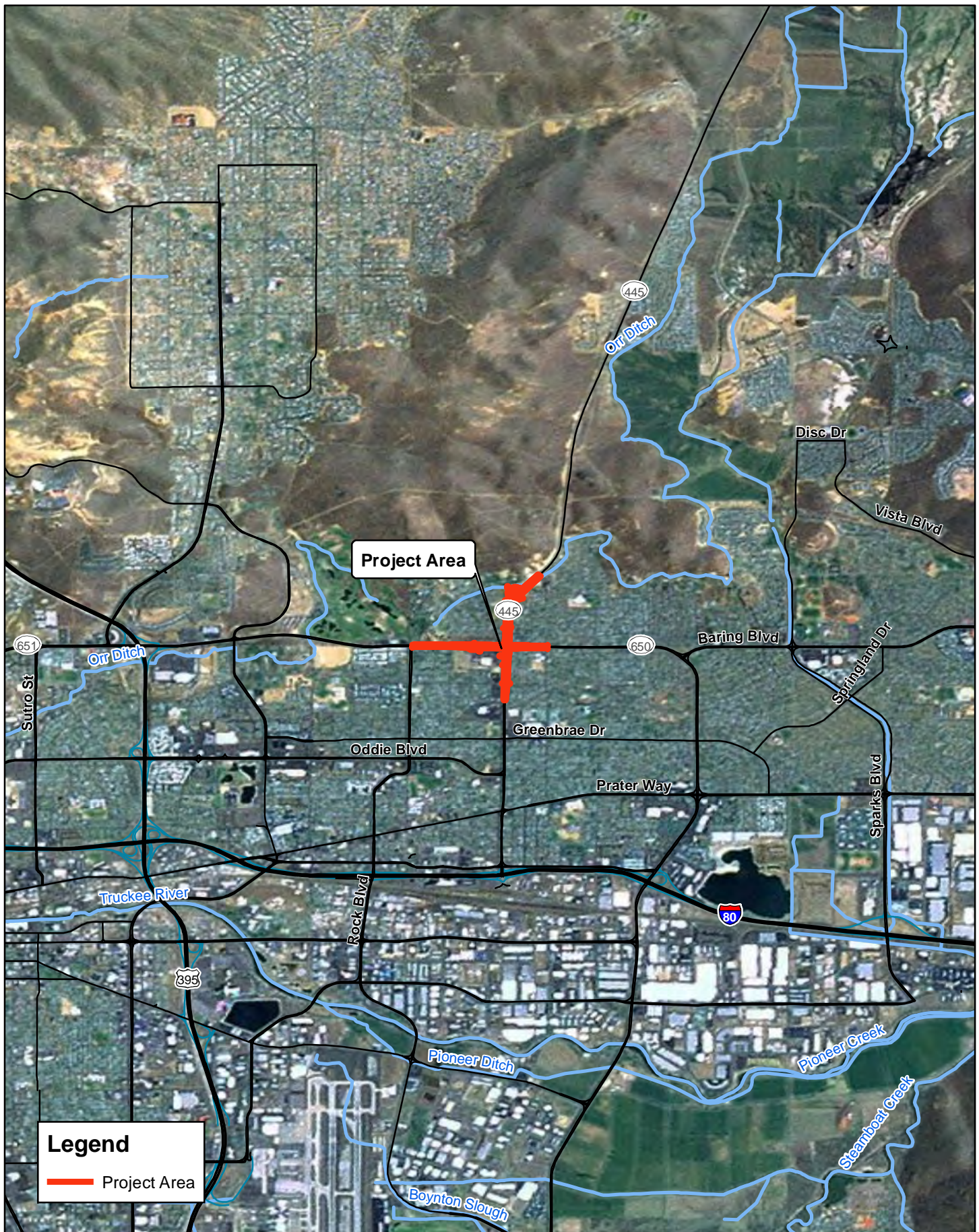


The average rainfall in Nevada varies greatly from region to region. To account for the various rain patterns, the State is separated into several rainy seasons. According to NDOT's Construction Site BMP Manual (NDOT 2006a), the Project area is located within Area 2. Area 2 is affected by winter storms and snowmelt runoff. Annually, the Project area, on average, receives approximately 7.8 inches of rainfall. Most of the precipitation occurs during the winter months. Winters in the Project area are characterized as cold, with an average temperature range in January from 23.5 to 47.3 degrees Fahrenheit (°F). Summer temperatures in July are warm and average from 53.6 to 91.7 °F. (Western Regional Climate Center 2011).

Hydrographic Area

Within the Pyramid Way and McCarran Boulevard project limits, offsite drainage flows from north to south. Flow is conveyed south along Pyramid Way and east along McCarran Boulevard to a trunk line in McCarran Boulevard. The trunk line in McCarran Boulevard is the primary outfall for drainage in the Pyramid Way/McCarran Boulevard intersection improvement area. The project area lies within the North Truckee Drain sub-basin, a major drainage facility for Sparks and the Spanish Springs area. The McCarran Boulevard trunk line connects to the North Truckee Drain at Sparks Boulevard (Parsons 2011), which ultimately conveys flows to the Truckee River at the Lockwood Bridge (NDEP 1994).

The Truckee River Basin includes Lake Tahoe and the Lake Tahoe Basin, the 105-mile long Truckee River, a number of lesser upstream storage lakes and reservoirs, various tributaries, and the Truckee River's terminus, Pyramid Lake. The Truckee River system consists of five (5) major river reaches. The reach identified as NV06-TR-05_00 (from Lockwood to Derby Dam) (NDEP 2009), includes the 15-mile reach through the Truckee Meadows hydrographic region. Several tributaries enter the Truckee River along this reach, the most important being Steamboat Creek which is outside of the Project area (See Figure 3-2).



3.2.1 Existing Water Quality

The NDEP manages a statewide monitoring program to evaluate the chemical and physical quality of the State's water resources. Of particular interest, is site T9 designated as the North Truckee Drain (NDEP 2011). This location is of special interest because it is downstream from the North Truckee Drain and NDEP has also established this site as the total maximum daily load (TMDL) compliance point for the Truckee Meadows hydrographic region (NDEP 1994). Water quality data measured at this location are summarized in Appendix A.

3.2.1.1 Beneficial Uses

Nevada's water quality standards, as identified in the Nevada Administrative Code (NAC) 445A.118 – 445A.225, identify the water quality goals for a water body, or a portion of a water body, by designating beneficial uses of the water and establishing criteria necessary to protect those beneficial uses (NDEP 2009). In many cases, like the Truckee River, two or more reaches exist for a river system, with each reach possibly having different beneficial uses and numeric criteria. Reaches are established at specific control points pursuant to the Tributary Rule referenced at NAC 445A.145. The water quality criteria are applicable at the specific control point as well as the remainder of the water body upstream, all upstream surface waters or to the next upstream control point. If there are no control points downstream from a particular control point, the standards for that control point apply for the remainder of the water body downstream, all surface waters downstream (in Nevada) or to the next water body downstream that is identified in the NAC (NDEP 2009). As referenced in the NAC, the beneficial uses for Truckee River at the North Truckee Drain are displayed in Table 3-1. NAC water quality standards for the Truckee River at Lockwood Bridge are displayed in Table 3-2. These standards give the highest single value for the most restrictive beneficial use and are applicable from the Lockwood Bridge control point to the East McCarran control point.

Table 3-1. Truckee River Beneficial Uses

NAC	Name	Description	Beneficial Uses								Aquatic Species of Concern
			IRR	STOCK	REC-1	REC-2	IND	MUN	WILD	AQUATIC	
445A.187	Truckee River	East McCarran Boulevard to Lockwood	X	X	X	X	X	X	X	X	Juvenile and adult rainbow trout Juvenile and adult brown trout

IRR	Irrigation
STOCK	Watering of Livestock
REC-2	Recreation not involving contact with the water
IND	Industrial Supply
MUN	Municipal or Domestic Supply or Both
WILD	Propagation of Wildlife
AQUATIC	Propagation of Aquatic Life

**Table 3-2 STANDARDS OF WATER QUALITY
Truckee River at Lockwood Bridge**

PARAMETER	REQUIREMENTS TO MAINTAIN EXISTING HIGHER QUALITY	WATER QUALITY STANDARDS FOR BENEFICIAL USES	BENEFICIAL USES
Temperature °C- Maximum ΔT^a	 $\Delta T = 0^\circ\text{C}$	Nov.-Mar.: $\leq 13^\circ\text{C}$ Apr.: $\leq 21^\circ\text{C}^e$ May: $\leq 22^\circ\text{C}^{e,f}$ June-Oct.: $\leq 23^\circ\text{C}^{e,f}$ $\Delta T \leq 2^\circ\text{C}$	Aquatic life ^b and water contact recreation.
pH Units	7.1 - 8.5	S.V.: 6.5 - 9.0 $\Delta\text{pH}: \pm 0.5 \text{ Max.}$	Water contact recreation ^b , wildlife propagation ^b , aquatic life, irrigation, stock watering, municipal or domestic supply and industrial supply.
Dissolved Oxygen - mg/l	--	S.V.: Nov.-Mar.: ≥ 6.0 Apr.-Oct.: ≥ 5.0	Aquatic life ^b , water contact recreation, wildlife propagation, stock watering, municipal or domestic supply and noncontact recreation.
Chlorides - mg/l	A-Avg.: ≤ 26.0 S.V.: ≤ 30.0	S.V.: ≤ 250	Municipal or domestic supply ^b , wildlife propagation, irrigation and stock watering.
Total Phosphates (as P) - mg/l	--	A-Avg.: ≤ 0.05	Aquatic life ^b , water contact recreation ^b , municipal or domestic supply and noncontact recreation.
Nitrogen Species (N) - mg/l	--	TN A-Avg.: ≤ 0.75 TN S.V.: ≤ 1.2 Nitrate S.V.: ≤ 2.0 Nitrite S.V.: ≤ 0.04 Ammonia S.V.: ≤ 0.02 (un-ionized)	Aquatic life ^b , water contact recreation ^b , municipal or domestic supply and noncontact recreation.
Total Dissolved Solids - mg/l	A-Avg.: ≤ 210.0 S.V.: ≤ 260.0	A-Avg.: ≤ 500	Municipal or domestic supply ^b , irrigation and stock watering.
Turbidity - NTU	--	S.V.: ≤ 10	Aquatic life ^b and municipal or domestic supply.
Color - PCU	d	S.V.: ≤ 75	Municipal or domestic supply.
Alkalinity (as CaCO_3) - mg/l	--	less than 25% change from natural conditions	Aquatic life ^b and wildlife propagation.
Fecal Coliform - No./100 ml	A.G.M.: ≤ 90.0 S.V.: ≤ 300.0	$\leq 200/400^e$	Water contact recreation ^b , noncontact recreation, municipal or domestic supply, irrigation, wildlife propagation and stock watering.
Suspended Solids - mg/l	A-Avg.: ≤ 25.0	S.V.: ≤ 50	Aquatic life ^b .
Sulfate - mg/l	A-Avg.: ≤ 39.0 S.V.: ≤ 46.0	S.V.: ≤ 250	Municipal or domestic supply ^b .

PARAMETER	REQUIREMENTS TO MAINTAIN EXISTING HIGHER QUALITY	WATER QUALITY STANDARDS FOR BENEFICIAL USES	BENEFICIAL USES
Sodium - SAR	A-Avg.: ≤ 1.5 S.V.: ≤ 2.0	A-Avg.: ≤ 8	Irrigation ^b and municipal or domestic supply.

- Maximum allowable increase in temperature above water temperature at the boundary of an approved mixing zone, but the increase must not cause a violation of the single value standard. The ΔT of $\leq 2^{\circ}\text{C}$ is only for the Reno and Sparks Joint Wastewater Treatment Plant.
- The most restrictive beneficial use.
- Based on the minimum of not less than 5 samples taken over a 30-day period, the fecal coliform bacterial level may not exceed a geometric mean of 200 per 100 ml nor may more than 10 percent of the total samples taken during any 30-day period exceed 400 per 100 ml.
- Increase in color must not be more than 10 PCU above natural conditions.
- When flows are adequate to induce spawning runs of cui-ui and Lahontan cutthroat trout, the standard is 14°C from April through June.
- The desired temperature for the protection of juvenile Lahontan cutthroat trout is 21°C , even though that temperature is not attainable at all times.

[Environmental Comm'n, Water Pollution Control Reg. part § 4.2.5, Table 42, eff. 5-2-78; A 1-25-79; 8-28-79; 1-25-80; 12-3-80]—(NAC A 10-25-84; 10-29-93)—(Substituted in revision for NAC 445.13467)

3.2.1.2 Section 303(d) of the Clean Water Act

The CWA requires States to identify water bodies that are considered impaired, which means the water body does not meet water quality standards. States must then place these water bodies onto a list, referred to as the “Clean Water Act Section 303(d) List of Water Quality Limited Segments”. On February 17, 2009 the NDEP approved the State’s Final 2006 303(d) Impaired Waters List which identifies CWA Section 303(d) water bodies that are not meeting water quality standards.

The Truckee River from East McCarran Boulevard to Lockwood is not listed as impaired on Nevada’s Final 2006 303(d) Impaired Waters List.

3.2.1.3 Total Maximum Daily Loads (TMDLs)

Once a water body is placed on the 303(d) List of Water Quality Limited Segments (List), the State is required to develop a TMDL to address each pollutant causing the impairment. A TMDL defines how much of a pollutant load a water body can tolerate and still meet water quality standards. The TMDL is required to account for contributions from point sources (permitted discharges) as well as contributions from nonpoint sources, including natural background. TMDLs allocate allowable pollutant loads for each source, and identify management measures that, when implemented, will assure that water quality standards are attained. Pursuant to 40 CFR 130, the List must contain a prioritized schedule for establishing TMDLs. For the Truckee River, TMDLs have been established for Total Dissolved Solids, Total Nitrogen and Total Phosphorus (NDOT 2005). According to Nevada’s Final 2006 303(d) Impaired Waters List, TMDLs for Total Suspended Solids, Turbidity and Temperature have been given a Low TMDL Priority. These TMDLs are associated with reaches other than the East McCarran Boulevard to Lockwood reach of the Truckee River.

3.3 Environmental Consequences

Construction and operation of the Project has the potential to impact water quality. BMPs would be evaluated and implemented to address potential impacts during the planning and design, construction and operational phases.

Potential pollutant sources associated with the construction phase of the proposed project include construction activities and materials anticipated at the Project site. Table 3-3 displays potential pollutant sources along with their associated pollutant typical for transportation infrastructure construction sites like the Pyramid Way and McCarran Boulevard Intersection Improvement Project.

Table 3-3. Construction Site Activities, Materials and Associated Pollutants

Construction Site Activity	Construction Site Materials	Pollutant
Vehicle and Equipment Cleaning, Fueling, and Maintenance	Vehicle Fluids	Oil Grease Petroleum Coolants
Concrete Cement Operations and Concrete Waste Management	Portland Concrete Cement and Masonry Products	Portland Concrete Cement
		Masonry Products
		Sealant (Methyl Methacrylate)
		Incinerator Bottom Ash Bottom Ash Steel Slag Foundry Sand Fly Ash
		Mortar Concrete Rinse Water
	Curing Compounds	Non-Pigmented Curing Compounds
Landscaping	Landscaping and Other Products	Aluminum Sulfate
		Sulfur-Elemental
		Fertilizers-Inorganic
		Fertilizers-Organic
		Natural Earth (Sand Gravel and Topsoil)
		Herbicide
		Pesticide
		Lime
Excavation and Grading	Contaminated Soil	Aerially Deposited Lead
		Petroleum
Source: NDOT 2006		

Potential pollutants associated with the operation of transportation facilities include sediment from natural erosion; nutrients, such as phosphorus and nitrogen, associated with freeway landscaping, mineralized organic matter in soils, nitrite discharges from automobile exhausts, and atmospheric fallout; litter; and metals from the combustion of fossil fuels, the wearing of brake pads and corrosion of galvanized structures (NDOT 2006).

Table 3-4 lists the existing project tributary area (both pervious and impervious) within the Truckee Meadows watershed. The watershed area is compared to the area of existing NDOT right-of-way within the Project limits. The maximum NDOT tributary area to the watershed is less than 1 percent.

Table 3-4. Existing Project Tributary Area within the Truckee Meadows Watershed

Watershed	County	Watershed Area (Acres)	Existing Project Tributary Area (acres)	Existing Project Contribution to Watershed (%)
			Build Alternative	Build Alternative
Truckee Meadows	Washoe	129,920	23.31	0.018

3.3.1 Build Alternative

Potential long term impacts were analyzed by determining the proposed additional impervious surface area (ISA) for the Build Alternative. Table 3-5 compares the existing and proposed ISA, within the Project limits, for the Build Alternative. Overall, the Build Alternative would result in a 30 percent increase in additional ISA within the Project limits.

Table 3-5. Comparison of Existing and Proposed Impervious Surface Area for the Build Alternative

Existing Impervious Surface Area	Proposed Additional Impervious Surface Area	Total Impervious Surface Area	Percentage of Additional Impervious Surface Area
(acres)	(acres)	(acres)	(%)
17.08	7.33	24.41	30

The Build Alternative may include the design and installation of Permanent BMPs to the maximum extent practicable (MEP). The Planning and Design Guide (NDOT 2006) would be

used to determine the use of potential Permanent BMPs. The Planning and Design Guide classifies Permanent BMPs into two categories: 1) Soil Stabilization (Source Control) BMPs and 2) Treatment Control BMPs (NDOT 2005). The applicability of NDOT's Permanent BMPs would be analyzed for the entirety of the Project from a water quality perspective in relation to the receiving water bodies within the proposed project limits. A Permanent BMP strategy to compensate for potential pollutant sources associated with the operation of the Project would be developed during subsequent design phases.

Without implementation of NDOT Permanent BMPs, increases in impervious areas could impact downstream channel erosion processes leading to increased channel scouring and sediment deposition through changes in peak discharges and runoff volumes. With implementation of NDOT Permanent BMPs, the runoff from the roadway would be attenuated and the pre-project flow regime would be maintained.

For the Build Alternative, the water quality flow (WQF) and the water quality volume (WQV) would be routed away from local drainage courses and conveyed to an appropriate Permanent BMP. Therefore, at the onset of a design storm event¹ it is anticipated that there will be no observable increase in the surface water quality constituent loadings at each of the local drainage areas.

Section 3.4 discusses Project Design and Maintenance BMPs as permanent measures which would be implemented to improve storm water quality during the operation of the transportation facility after completion of construction.

Potential short term impacts were analyzed by determining the amount of DSA for the Build Alternative. Table 3-6 displays the temporary DSA for the Build Alternative. Short term impacts caused by the Build Alternative include potential increases in sediment loads due to removal of existing groundcover and disturbance of soil during grading. Implementation of the Storm Water Pollution Prevention Plan (SWPPP) is expected to attenuate and minimize the amount of soil released from the construction site. The temporary residual increase in sediment loads from construction areas is unlikely to alter the hydrologic response downstream in the Truckee Meadows hydrographic region, and subsequently, the sediment processes in this area because of the negligible potential for sediment erosion and deposition. Furthermore, all DSAs would be stabilized before completion of the construction project with permanent landscaping and/or

¹ The maximized detention volume is determined by the 85th percentile runoff capture ratio. This method is described in Chapter 5 of the *Urban Runoff Quality Management WEF Manual of Practice No. 23*, 1998, published jointly by the Water Environment Federation (WEF) and the American Society of Civil Engineers (ASCE). This method requires the designer to assume a drawdown time. Drawdown time between 2 and 7 days can be used (the 2 day limit provides adequate settling and the 7 day maximum addresses vector concerns) (NDOT 2006).

permanent erosion control (i.e. soil stabilization) measures. Therefore, with incorporation of temporary and permanent BMPs no significant adverse impacts are anticipated with implementation of the Pyramid Way and McCarran Boulevard Intersection Improvement Project.

Table 3-6. Temporary Disturbed Soil Area for the Build Alternative

Watershed	County	Watershed Area (Acres)	Disturbed Soil Area (acres)
			Build Alternative
Truckee Meadows	Washoe	129,920	27.50

3.3.2 No Build Alternative

The No Build Alternative would not construct the Pyramid Way and McCarran Boulevard Intersection Improvement Project and would therefore have no impacts to existing water quality.

3.4 Avoidance, Minimization and/or Mitigation Measures

Temporary, permanent and maintenance BMPs would be implemented during the construction and operation of the Pyramid Way and McCarran Boulevard Intersection Improvement Project to minimize potential storm water and non-storm impacts to water quality. The NDOT Storm Water Management Plan (SWMP) (NDOT 2005) describes how NDOT would comply with their Statewide MS4 Permit. The SWMP characterizes the program that NDOT would implement to minimize the discharge of pollutants associated with storm drainage systems that serve highways, highway-related properties, facilities and activities. Specifically, the SWMP identifies BMPs that shall be considered to meet the MEP and the BAT/BCT requirements and to address compliance with water quality standards. The BMPs are organized into three categories as shown in Table 3-7.

**Table 3-7
NDOT BMP Categories**

BMP	Description
Temporary	Temporary soil stabilization and sediment control; non-storm water management, waste management and material pollution control; slope protection; and disturbed area stabilization BMPs.
Permanent	Designed to control pollution at the source or treat storm water runoff by removing contaminants. Permanent BMPs include Source Control Measures or Soil Stabilization BMPs and Treatment Control Measures.
Maintenance	Storm water drainage system facility maintenance activities such as inspection of drop inlets and culverts for silt, debris or blockage; erosion control BMPs on damaged slopes; snow removal and ice control; vegetated treatment control; pesticide, herbicide and fertilizer management BMPs; and hazardous materials management BMPs.

Source: NDOT 2005

Potential short term water quality impacts associated with the construction phase would be minimized with the implementation of Temporary BMPs. Potential long term water quality impacts associated with the operation and maintenance of the transportation facility would be minimized with the implementation of Maintenance and Permanent BMPs. Overall, with incorporation of Temporary, Permanent and Maintenance BMPs, no significant adverse impacts are anticipated with the implementation of the Pyramid Way and McCarran Boulevard Intersection Improvement Project.

3.4.1 Temporary BMPs

Temporary BMPs would be applied during construction activities to minimize the pollutants in storm water and non-storm water discharges throughout construction. The Temporary BMPs would provide temporary erosion and sediment control as well as control for potential pollutants other than sediment. Table 3-8 displays the five categories of Temporary BMPs that NDOT has identified as suitable for controlling potential pollutants on construction sites. Although specific Temporary BMPs have not been identified, the following categories of BMPs would be implemented for the Project. Detailed information regarding the specific Temporary BMP associated with each category can be found in NDOT's Construction Site BMP Manual (NDOT 2006a).

Table 3.-8 Temporary BMP Categories

Category
Soil Stabilization
Sediment Control
Tracking Control
Non-Storm Water Management
Waste Management and Materials Pollution Control
Source: NDOT 2006a

Temporary BMPs would be evaluated and identified through the preparation of the SWPPP. The SWPPP would address all state and federal water quality control requirements and regulations. The SWPPP would address all construction-related activities, equipment, and materials that have the potential to impact water quality. The SWPPP would identify BMPs to minimize pollutants, sediment from erosion, storm water runoff, and other construction-related impacts. The Temporary BMPs identified in the SWPPP would be consistent and would comply with the control practices required under the Construction General Permit.

3.4.2 Permanent BMPs

Permanent BMPs are measures that improve storm water quality after construction is complete. NDOT has organized their Permanent BMPs into two categories which are: 1) Source Control Measures or Soil Stabilization BMPs; and 2) Treatment Control BMPs (NDOT 2005).

3.4.2.1 Permanent Soil Stabilization BMPs

Permanent Soil Stabilization BMPs are implemented to control the pollution at the source, thereby protecting the downstream environment from pollutants in storm water runoff. The three objectives associated with Permanent Soil Stabilization BMPs include maximizing vegetated surfaces; preventing downstream erosion; and stabilizing soil areas. These design objectives would be applied to the entire Project. Without incorporation of Permanent Soil Stabilization BMPs, the Project may have an effect on downstream channel stability due to changes in the velocity or volume of runoff or the sediment load. Table 3-9 displays the NDOT-approved Permanent Soil Stabilization BMPs and a discussion regarding these BMPs is provided in the following sub-sections.

Table 3-9. Permanent Soil Stabilization BMPs

Soil Stabilization BMP
<i>Consideration of Downstream Effects Related to Potentially Increased Flow</i>
<i>Preservation of Existing Vegetation</i>
<i>Ditches, Berms, Dikes and Swales</i>
<i>Slope Down Drains</i>
<i>Flared Culvert End Sections</i>
<i>Outlet Protection/Velocity Dissipation Devices</i>
<i>Vegetated Surfaces</i>
<i>Mulching</i>
<i>Slope Roughening/Terracing/Rounding</i>
<i>Hard Surfaces</i>
<i>Retaining Walls</i>
Source: NDOT 2005

Consideration of Downstream Effects Related to Potentially Increased Flow

All transitions between culvert outlets, headwalls, wingwalls, and channels would be smoothed to minimize turbulence and scour. Offsite runoff would be handled by allowing flows to pass under or around the proposed facility, and the existing drainage pattern would not be altered.

Offsite flows would be managed in a manner which would mimic the existing drainage network, and not inundate the roadway surface or any of the existing drainage system. The proposed project would require coordination with all drainages that would be affected, including those that are locally (City/County) owned.

Preservation of Existing Vegetation

The project design would consider minimizing the foot print and matching the existing grading as close as possible so as to preserve as much of the existing vegetation as possible

Ditches, Berms, Dikes and Swales/Slope Down Drains/Flared Culvert End Sections

Since it would be necessary to direct or intercept surface runoff, the proposed Project would modify ditches, dikes, berms, or swales. Risks due to erosion or washout would be minimized through the use of erosion control measures such as hydroseeding, ground cover, and mulch. Velocity dissipation devices, flared end outlets, headwalls, transition structures, and splash walls would be incorporated into the design where necessary at culvert inlets and outlets to prevent erosion. Ditches would be modified and box culverts would be extended to help intercept sheet flow where necessary and to convey it to facilities that cross under the roadway.

Vegetated Surfaces/Mulching/Slope Roughening/Hard Surfaces/Retaining Walls

The preservation of existing vegetation would be maximized to help minimize the amount of clearing and grubbing that would be required on slopes. In an effort to minimize concentrated flows, benches or terraces would be provided during original construction on high cut and fill slopes and slopes would be rounded or shaped accordingly. Disturbed slopes would be re-vegetated per the NDOT-approved Erosion Control Plan.

3.4.2.2 Permanent Treatment Control BMPs

Treatment Control BMPs are measures that improve storm water quality after construction is complete. Treatment Control BMPs are often referred to as structural controls. NDOT has approved five Permanent Treatment Control BMPs for statewide use. These BMPs would be considered for the proposed Project, pursuant to Section 2 of the Planning and Design Guide (NDOT 2006), to minimize the long term potential impacts from NDOT facilities or activities. Table 3-10 displays the NDOT-approved Permanent Treatment Control BMPs.

Table 3-10. Permanent Treatment Control BMPs

Treatment Control BMP	BMP Description
Biofiltration Strips and Swales	Intended to reduce the pollutant load by slowing flows allowing pollutants to settle, as well as promoting biological uptake and infiltration.
Infiltration Basins	Designed to capture and hold runoff allowing infiltration, promoting pollutant removal, and reducing runoff volumes.
Detention Basins	Used to capture and detain storm water runoff promoting pollutant removal.

Treatment Control BMP	BMP Description
Traction Sand Traps	Allows traction sand to settle out of highway runoff before discharged into receiving waters.
Gross Solids Removal Devices	Designed to remove trash and solids from storm water runoff through physical and mechanical means.

During the design phases, outlined in NDOT's Planning and Design Guide, the applicability of all five NDOT-approved Treatment BMPs would be analyzed for the Project and a proposed Permanent Treatment Control BMP strategy would be developed.

3.4.3 Maintenance BMPs

NDOT's Maintenance Division is responsible for conducting a number of maintenance activities at different facilities throughout the State to ensure that the maximum benefits associated with constructed facilities are available to the travelling public. Most of these activities are handled by small crews with a minimal amount of soil disturbance.

The purpose of applying Maintenance BMPs is to implement water quality controls that would minimize pollutant discharges during highway maintenance activities. Maintenance activities along with the application of Maintenance BMPs would be on-going throughout the lifespan of the facility. All of the Maintenance BMPs implemented would be consistent with the specifications and guidelines presented in the SWMP (NDOT 2005), the Planning and Design Guide (NDOT 2006) and the Construction BMP Manual (NDOT 2006a).

3.5 Mitigation

3.5.1 Construction Phase (Short Term)

The Contractor shall conform to current federal, State, and local regulatory requirements to minimize impacts to water resources and water quality, including:

- WQ-1:** Conforming to the requirements of the NDOT Statewide Municipal Separate Storm Sewer System (MS4) Permit, NV0023329, in addition to the BMPs specified in the NDOT Storm Water Management Plan (NDOT 2005). The Contractor shall also conform to the requirements of the General Permit for Storm Water Discharges Associated with Construction Activity, NPDES No. NVR100000 and any subsequent permit in effect at the time of construction.
- WQ-2:** Preparing and implementing the SWPPP. The SWPPP shall address all State and federal water control requirements and regulations. The SWPPP shall address all construction-related activities, equipment, and materials that have the potential to impact water quality. All Temporary BMPs would follow the latest edition of the Storm Water

Quality Handbooks, Construction Site BMP Manual (NDOT 2006a) to control and minimize the impacts of construction related pollutants. The SWPPP shall include BMPs to control pollutants, sediment from erosion, storm water runoff, and other construction-related impacts.

All work will conform to the Temporary BMP requirements specified in the latest edition of the NDOT SWMP to control and minimize the impacts of construction and construction-related activities, materials, and pollutants on the watershed(s). These include, but are not limited to, temporary sediment control, temporary soil stabilization, scheduling, waste management, materials handling, and other non-storm water BMPs.

3.5.2 Post-Construction Period (Long Term)

The NDOT SWMP describes BMPs and practices to reduce the discharge of pollutants associated with the storm water drainage systems of State highways, facilities, and activities. The completed project plans would incorporate all necessary Maintenance BMPs and Permanent BMPs to meet the MEP requirements. A combination of BMPs from the following categories would be implemented as part of the proposed project:

- **WQ-3:** Permanent Soil Stabilization BMPs – Permanent soil stabilization systems would be incorporated into project design, such as preservation of existing vegetation, concentrated flow conveyance systems (e.g., drainage ditches, dikes, berms, swales), and slope/surface protection systems that utilize either vegetated or hard surfaces. Identification of Permanent Soil Stabilization BMPs would occur during final design.
- **WQ-4:** Treatment Control BMPs – All NDOT-approved Treatment Control BMPs would be implemented to the Maximum Extent Practicable (MEP). Treatment Control BMPs may include traction sand traps, infiltration devices, detention devices, biofiltration strips/swales, and gross solids removal devices.

References

- Division of Water Resources, State of Nevada. 2011. Hydrologic Overview of the Lake Tahoe and Truckee River Basins. (Researched online at: <http://water.nv.gov/mapping/chronologies/truckee/part1.cfm/part1.cfm>). August 3, 2011.
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- Nevada Division of Environmental Protection (NDEP), Bureau of Water Quality Planning. 1994. Truckee River Total Maximum Daily Loads (TMDLs) and Waste Load Allocations (WLAs), Final. February 1994.
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- Parsons. 2011. Design Alternatives Report, Draft. July 26, 2011.
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Appendix A

Table A.1. Water Quality Parameters
North Truckee Drain at the Truckee River (T9/NV06-102-C-001)
1999 - 2008

	DISSOLVED O ₂ MG/L	pH FIELD	pH LAB	CONDUCTIVITY (UM/CM)	PCU	SOLIDS MG/L	NTU	TOTAL MG/L	AMMONIA MG/L	AMMONIA MG/L	AMMONIA MG/L	AMMONIA MG/L	N AMMONIA DISSOLVED MG/L N	PHOSPHORUS (P) TOTAL MG/L	ORTHO P MG/L P
MIN	4.9	7.7	7.65	320	5	10	<10	1.1	0.001	0.24	1.07	0.31	0.019	0.067	0.026
MAX	12	8.6	8.55	1539	60	164	72	3.8	0.066	3.19	14.1	1.2	0.18	0.31	0.18
AVG	8.2	8.2	8.15	774	26	23	12	2.1	0.030	1.25	5.54	0.77	0.073	0.16	0.083

Source:

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER QUALITY PLANNING
GRAB/SURFACE WATER SAMPLES
PROVISIONAL RECORDS